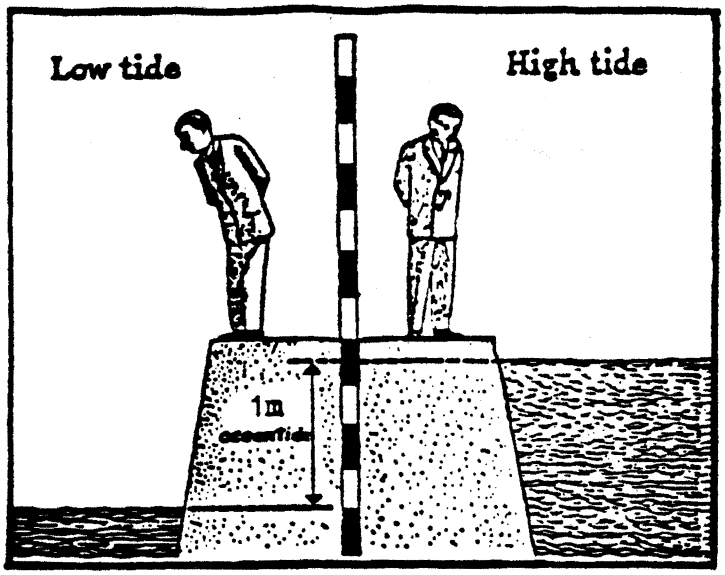
NAME _____ DATE _____ LAB # _____

MEASURING A CHANGE: THE TIDES

BACKGROUND:



The periodic change in the level of the ocean water is called the **tides**. Tides are caused by the gravitational pull of the Moon and the Sun on the Earth.

Streams which empty into the ocean, like the Hudson River, are affected by the rise and fall of the tides. For the Hudson River, this effect travels all the way up to Albany!

The TIDAL DATA TABLE on the next page shows the changing water level as measured at Peekskill, a city on the eastern side of the Hudson River just across the Bear Mountain Bridge. The height of the water is measured in meters from the midpoint between high tide and low tide.

PURPOSE:

A. to understand the nature of change

B. to graphically organize and analyze a set of observations

C. to use the data to make predictions

METHOD:

1. Use the TIDAL DATA TABLE to construct a graph with the following instructions:

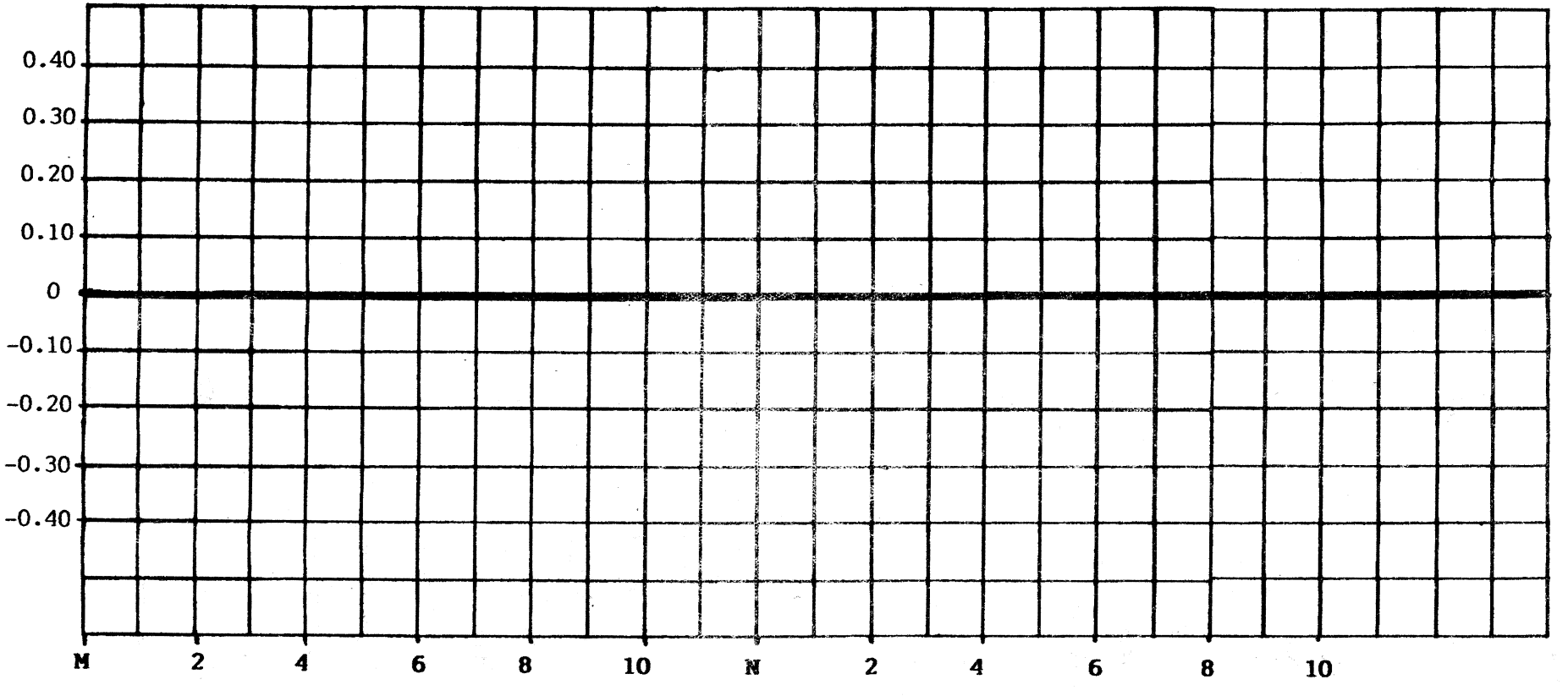
   A. Hold the graph paper horizontally so that the x-axis occupies the longest side. Label this axis "Time of Day" and space the hours of the day along the entire axis.
   B. Construct a "0 meter" line midway up the y-axis and extend it completely across the grid. You will mark the negative water height values below this line, and the positive values above it.
   C. After plotting all points, connect them with a smooth curve.

2. Answer the questions which follow.

T I D A L D A T A T A B L E :

Hour of the day	Height of the water
12 midnight	0.40 meters
1 am	0.25 meters
2 am	0.10 meters
3 am	0 meters
4 am	-0.10 meters
5 am	-0.30 meters
6 am	-0.40 meters
7 am	-0.30 meters
8 am	-0.15 meters
9 am	0 meters
10 am	0.10 meters
11 am	0.20 meters
12 noon	0.35 meters
1 pm	0.35 meters
2 pm	0.25 meters
3 pm	0.10 meters
4 pm	0 meters
5 pm	-0.10 meters
6 pm	-0.20 meters
7 pm	-0.35 meters
8 pm	-0.30 meters
9 pm	-0.20 meters
10 pm	-0.10 meters
11 pm	0 meters

TIDAL RANGE GRAPH FOR PEEKSKILL, N.Y.



QUESTIONS:

1. According to the data, at what time did the first high tide occur? _____

   _____

2. Estimate the time of the second high tide for this day: _____

3. What is the approximate time between one high tide and the next successive high tide? _____ What is the approximate time between successive low tides? _____

5. Using the graph, predict the time of the next high tide: _____

8. The tidal range is the number of meters measured between the highest water level and the lowest water level. What is the tidal range? _____

9. Does it appear that the tidal range is a constant number? _____ How can you tell? _____

   _____

10. What evidence indicates that the change of tides is cyclic? _____

    _____

    _____